

Jan. 19, 2005 – HIRDLS validation, sonde intercomparison, and tropopause layer sampling

Summary:

The HIRDLS track was essentially directly overhead providing an excellent opportunity for a validation flight. The aircraft flew south along the track and executed slow ascents and descents through the tropopause region (53–56 kft). A dive to 40 kft was included near the southern end of the flight track. After the dive, the aircraft flew at maximum altitude on the way back to San Jose. We satisfied all of our objectives on this flight. 19 of the 21 instruments on the aircraft performed well. Highlights included:

- Multiple thin cirrus layers were detected in the tropopause layer between 16.5 and 17.5 km (see Figure below). Based on information from the backseater CAPS display, the pilot porpoised through a layer between about 16.5 and 16.8 km. Identification of the altitudes of these layers should be useful for validation of the HIRDLS cloud measurements.
- Extremely cold air (≈ 185 K) was sampled near the tropopause.
- A zoom climb to 62 kft was executed over the airfield followed by a spiral descent.
- A frostpoint/ozone sonde was launched in coordination with the aircraft descent.
- The faint, dissipating WB-57 contrail was sampled briefly after turning around at the southern end of the flight track.

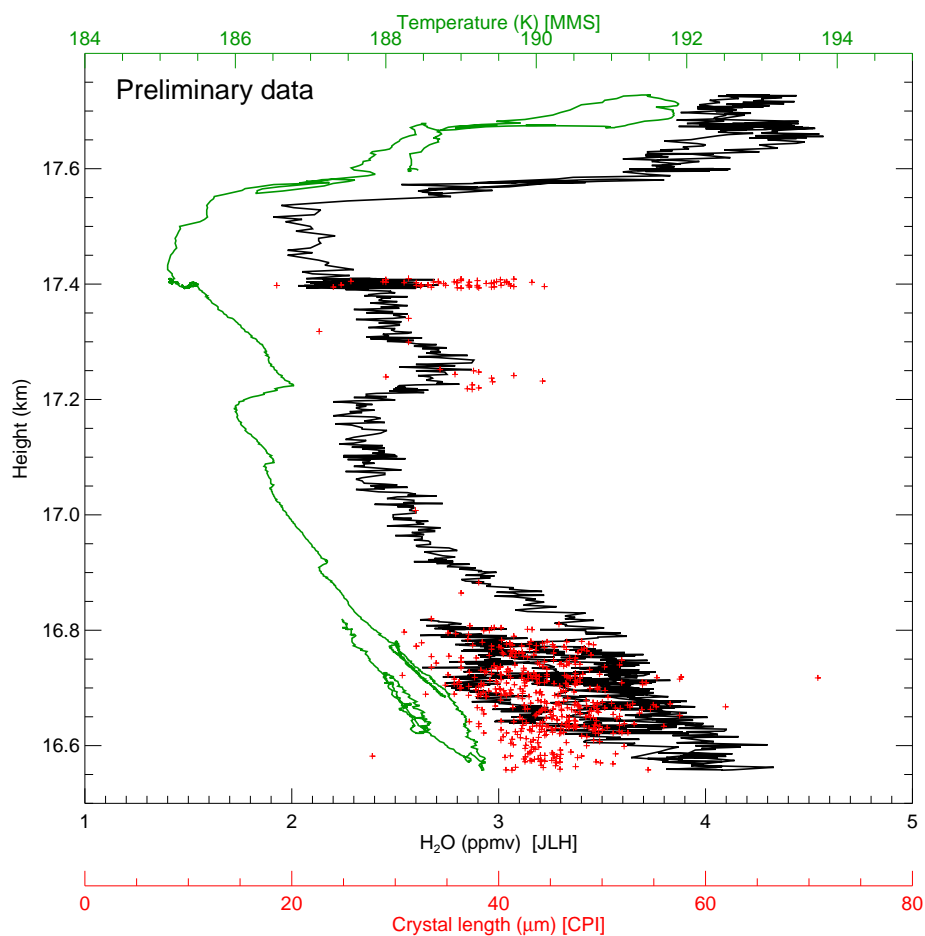


Figure 1: Profiles of temperature, water vapor concentration, and ice crystal length in the uppermost troposphere.